

SPECIFICATION

TITLE OF THE INVENTION

DISPLAY FORMING METHOD OF PACKAGING CASE, DECORATION BODY, AND PACKAGING CASE USING THE SAME

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

The present invention relates to a packaging case with a decoration body for packaging an article such as a golf ball, a golf globe or the like.

DESCRIPTION OF THE CONVENTIONAL ART

Conventionally, in the case of packaging the article such as the golf ball, the golf globe or the like, the packaging case is produced in correspondence to a country of production and a manufacturing plant, and the country of production and the manufacturing plant are described on the packaging case. Further, conventionally, in the case of presenting someone with the golf ball, a box receiving the golf ball is repackaged by another packaging case or a wrapping paper, a message or the like is described on the packaging case, or a card having the message or the like is attached on the wrapping paper.

However, it is inefficient to produce the packaging case in correspondence to the country of production and

the manufacturing plant so as to describe the country of production and the manufacturing plant on the packaging case, and package the golf ball by the independent packaging case from the box receiving the golf ball so as to describe the message or the like on the packaging case. Accordingly, it is desired to efficiently form the display of the country of production, the manufacturing plant, the message and the like on the packaging case.

On the contrary, as a technique of efficiently forming a display such as a character or the like on an article, there has been known a technique that a heat fading metallic compound is contained in a front face cover of a golf ball, and a character is described by utilizing a change in color on the basis of a heat applied by a laser beam (refer to patent document 1), and a technique that a character is described by applying a laser beam on a metal surface of a golf club head and forming an oxide film (refer to patent document 2).

Patent Document 1

Japanese Unexamined Patent Publication No. 9-28836

Patent Document 2

Japanese Unexamined Patent Publication No. 6-305241

However, in the techniques described in the patent documents mentioned above, it is necessary to previously use the material which is changed in color by the heat

applied by the laser beam. In the case that the techniques are applied to the packaging case, there is a problem that a manufacturing cost of the packaging case is expensive.

On the other hand, even when the message or the like is described on the packaging case mentioned above or the card having the message or the like is attached to the packaging case, the message or the like is only described on the decorated paper. Accordingly, the message is not only two-dimensional but also accompanies no motion, so that the message is lack of fun as the decoration body.

SUMMARY OF THE INVENTION

The present invention is made by taking the matters mentioned above into consideration, and a first object of the present invention is to provide a method of forming a display such as a character or the like efficiently and with a small cost on a packaging case for packaging an article such as a golf ball, a golf glove or the like by utilizing a laser beam.

Further, a second object of the present invention is to provide a decoration body for a golf ball packaging case which is not only three-dimensional but also performs a motion, thereby having a fun as a decoration body.

In order to achieve the first object mentioned above,

in accordance with the present invention, there is provided a method of forming a display of a packaging case comprising the steps of:

irradiating a laser beam on a front face of a packaging case produced by a paper sheet having a colored layer constituted by a coloring agent and a resin film layer for protecting the front face on the front face; and

evaporating the colored layer and the resin film layer by the laser beam, thereby forming the display on the packaging case.

In accordance with the present invention, the display is formed on the front face of the packaging case by evaporating the colored layer and the resin film layer in the packaging case by the laser beam. Accordingly, since it is not necessary to previously use the material which is changed in color by the heat of the laser beam at a time of producing the packaging case, it is possible to form the display of the character or the like efficiently and inexpensively by utilizing the laser beam.

In order to achieve the second object mentioned above, in accordance with the present invention, there is provided a decoration body for a golf ball packaging case comprising:

a front cover and a back cover which are folded along

a fold line; and

a bar body in which a base end portion is mounted to an inner surface of the front cover or the back cover and a golf ball shaped piece is attached to a leading end,

wherein a leading end portion of the bar body ascends step by step in accordance with an opening of the folded front cover.

The decoration body for the golf ball packaging case in accordance with the present invention has the front cover and the back cover which can be opened and closed, and the bar body, and is three-dimensional. Further, the leading end portion of the bar body ascends step by step in accordance with opening the folded front cover, and the golf ball shaped piece attached to the leading end portion of the bar body performs the motion that the golf ball shaped piece ascends like a hit golf ball. Accordingly, the decoration body has a fun as the decoration body. In this case, a transparent bar body is preferable because the golf ball shaped piece looks like flying through the air.

In the decoration for the golf ball packaging case in accordance with the present invention, no limitation is applied to a mechanism of performing an operation that the leading end portion of the bar body ascends step by

step in accordance with opening the folded front cover mentioned above, and an optional mechanism can be employed.

Further, the bar body mentioned above and the golf ball shaped piece may be constituted by the other members. Accordingly, the present invention provides a decoration body for a packaging case of the other articles than the golf ball comprising:

a front cover and a back cover which are folded along a fold line; and

an ascending member in which a base end portion is mounted to an inner surface of the front cover or the back cover,

wherein a leading end portion of the ascending member ascends step by step in accordance with an opening of the folded front cover.

Further, the decoration body for the golf ball packaging case is preferably structured such that a display by a UV coating material is applied to at least one surface which is selected from an inner surface and an outer surface of the front cover and an inner surface and an outer surface of the back cover. In other words, in conventional, in the case of presenting someone with the golf ball as a present for a special day, it is necessary to prepare a package for the present in addition to the

original packaging case. Accordingly, a service that the message is displayed on the packaging case can reduce a cost of placing a special order package, and is very pleased as a unique package for the presented person. Therefore, in accordance with the present invention, it is preferable to apply the display by the UV coating material to the surface of the front cover or the back cover.

The UV coating material (an ultraviolet curing type resin) is a coating material which is hardened and dried by an energy of an ultraviolet ray. The UV coating material is generally hardened by the ultraviolet ray having a very short wavelength about 250 to 450 nm. A high-pressure mercury lamp is frequently used for irradiating the ultraviolet ray, however, the UV coating material can be hardened by using a maxima laser (having a wavelength between 248 and 351 nm). In the case of hardening the UV coating material by the maxima laser as mentioned above, the display of the character or the like can be applied to the surface of the front cover or the back cover by previously applying the UV coating material onto the surface of the front cover or the back cover and by employing a masking method or a scanning method so as to form the portion to which the laser beam is directly irradiated without being masked, or scan the

laser beam. Further, it is possible to use the UV coating material in a pat printing or a screen printing, and it is possible to irradiate the ultraviolet ray or the maxima laser.

As the UV coating material, there can be listed up an unsaturated polyester resin UV coating material obtained by dissolving an unsaturated polyester resin in a styrene and adding a photo polymerization starting agent thereto, an acrylic UV coating material obtained by adding the photo polymerization starting agent to a mixture of an oligomer acrylate and a prepolymer acrylate, and the like. When the ultraviolet ray or the maxima laser is irradiated on the coating film by the UV coating material, the photo polymerization starting agent absorbs the ultraviolet ray or the maxima laser, and is changed radically by an energy thereof. The changed radical works with, for example, the oligomer acrylate and the prepolymer acrylate so as to generate a so-called radical polymerization, and a liquid coating material forms a solid coating film. Accordingly, the display formed by the hardened portion is left by removing the non-cured portion.

In this case, in the decoration body in accordance with the present invention, the front cover and the back cover can be produced, for example, by a paper having

a colored layer including a colored front face and a resin film layer protecting the front face, that is, a paper constituted by a paper (a base body), a colored layer and a resin film layer, and a paper constituted by a paper (a base body), a resin film layer and a colored layer. As is different from the coloring such as penetrating into the base body paper, the colored layer mentioned above is constituted mainly by a pigment for coloring and a resin forming the pigment as the layer (the UV coating material is preferable for forming the colored layer). Further, the display by the UV coating material is applied to the surface of the front cover and the back cover, whereby it is possible to obtain the structure that the display is constituted by the paper (the base body), the colored layer, the resin film layer and the UV coating material, and the structure that the display is constituted by the paper (the base body), the resin film layer, the colored layer and the UV coating material. However, the front cover and the back cover may be produced by the other optional materials.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic view showing an embodiment of a decoration body for a golf ball packaging case in accordance with the present invention;

Fig. 2 is an expansion view showing a member used

for a bar body ascending mechanism of the decoration body;

Fig. 3 is a front elevational view showing a folded state of the member;

Fig. 4 is a front elevational view showing an open state of the member; and

Figs. 5A and 5B show a state in which a decoration plate is applied to the decoration body for the golf ball packaging case, in which Fig. 5A is a side elevational view and Fig. 5B is a plan view.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A description will be further in detail given below of a packaging case in accordance with the present invention.

The packaging case in accordance with the present invention is produced by a paper sheet (a sheet having a paper as a base material) having a colored layer constituted by a coloring agent, and a resin film layer for protecting a front face provided on the front face.

The coloring agent is generally constituted by a pigment for mainly coloring, and a resin for forming a layer of the pigment, as is different from a dye penetrating into the paper (the base material). As the coloring agent, in order to produce a lot of colored packaging cases, the UV coating material (the ultraviolet curing type resin) mentioned above is particularly preferable.

The resin film layer mentioned above is provided for the purpose of preventing the packaging case from having a scratch due to a friction and preventing the packaging case from being worn. A material of the resin film layer is not limited, however, can employ, for example, a polypropylene, a polyester or the like.

Further, the structure of the paper sheet used in the present invention is not limited, and it is possible to employ, for example, a paper sheet constituted by a paper (a base material), a colored layer and a resin film layer, and a paper sheet constituted by a paper (a base material), a resin film layer and a colored layer. Another layer may be provided between the respective layers mentioned above, as occasion demands.

In accordance with the present invention, the display is formed on the packaging case by irradiating a laser beam onto a front face of the packaging case mentioned above by employing a masking method and a scanning method and evaporating the colored layer and the resin film layer by the laser beam. It is possible to more easily form the display on the packaging case by utilizing the laser beam. In other words, the laser beam has three features. A first matter is that a wavelength of the beam is a single wavelength, a second matter is that a phase is uniform, and a third matter

is that the beam goes in one direction without diffusing. The present invention utilizes three features mentioned above of the laser beam. In particular, since the phase of the laser beam is uniform, a stronger light beam can be formed by focusing the beam.

Accordingly, it is possible to evaporate the colored layer and the resin film layer by irradiating the laser beam on the surface of the packaging case produced by the paper sheet mentioned above. In this case, the kind of the laser beam is not necessarily limited, however, in the case of using a carbon dioxide gas laser having a long wavelength (wavelength: 10600 nm), the laser beam sufficiently heats and evaporates the colored layer and the resin film layer by its heat. Therefore, the laser beam irradiated portion in the colored layer and the resin film layer disappears and the paper layer corresponding to the base material of the paper sheet appears, whereby the display is well formed. For example, the resin film layer made of the polypropylene or the polyester is evaporated only in the portion to which the laser beam is irradiated by the carbon dioxide gas laser, together with the colored layer. Accordingly, in the present invention, it is particularly preferable in view of an outer appearance of the display to use the carbon dioxide gas laser beam for the laser beam.

On the other hand, in the case that the irradiation is performed by a laser beam (1064 nm) emitted from a YAG laser apparatus, there is a case that the resin film layer is not sufficiently heated and evaporated, and the irradiated portion is left in an elongated state due to the heating. However, it is possible to form the display of the character, the mark and the like even by employing the YAG laser, and it is possible to achieve the object of the present invention.

In this case, in accordance with the present invention, since the paper sheet having the base material constituted by the paper is employed as the material of the packaging case, a deformation caused by the heat of the packaging case is not generated in the case that the laser beam is irradiated on the surface of the packaging case, as is different from the plastic packaging case which is deformed due to the heat.

Here, one example of the kind of the laser beam, the state of the colored agent (UV coating material), the state of the resin film layer in the present invention will be shown in the following Table 1.

Table 1

Kind of laser

YAG laser

Carbon dioxide gas laser

Wavelength (nm)

UV coating material

Evaporated

Evaporated

Resin film layer

Heat deformed

Evaporated

Display formation

Display is formed by evaporation

Display is formed by evaporation

Evaluation

×: impossible

○: possible

◎: very good

As shown in Table 1, the YAG laser and the carbon dioxide gas laser can evaporate the colored layer, and can display the character, the mark and the like in accordance with the color of the base paper (the base material). The YAG laser can evaporate the colored layer, however, can not sufficiently evaporate the protecting film layer. Accordingly, the protecting film layer is sometimes in a bulge state in correspondence to the character, the mark and the like.

In the case of using the carbon dioxide gas laser, if the paper sheet has the protecting film layer as an

outermost layer, and has the colored layer between the protecting film layer and the paper (the base material), there is a case that a trace formed by melting the protecting film layer in the portion to which the laser beam is irradiated is left, however, the character, the mark and the like can be sufficiently identified. On the other hand, in the case of using the carbon dioxide gas laser, if the paper sheet has the colored layer as the outermost layer, and has the protecting film layer between the colored layer and the paper (the base material), the colored layer and the protecting film layer evaporate together by the heat, it is possible to describe the character and the figure more clearly than the case of using the ink in accordance with the printing, and a color development is improved owing to the colored layer arranged in the outer side.

In this case, the following Table 2 shows one example of a relation among the kind of the laser beam, the outer layer of the paper sheet, the intermediate layer of the paper sheet, the kind of the resin film layer and the thickness of the resin film layer in accordance with the present invention.

Table 2

Kind of laser

YAG laser

YAG laser

Carbon dioxide gas laser

Carbon dioxide gas laser

YAG laser

YAG laser

Carbon dioxide gas laser

Carbon dioxide gas laser

Outer layer

Protecting film

Protecting film

Protecting film

Protecting film

Acrylic type UV coating material

Acrylic type UV coating material

Acrylic type UV coating material

Acrylic type UV coating material

Intermediate layer

Acrylic type UV coating material

Acrylic type UV coating material

Acrylic type UV coating material

Acrylic type UV coating material

Protecting film

Protecting film

Protecting film

Protecting film

King of protecting film

Polypropylene

Polyester

Polypropylene

Polyester

Polypropylene

Polyester

Polypropylene

Polyester

Thickness of protecting film (μm)

Outer appearance

×: impossible

○: possible

◎: very good

In the present invention, in the case that the paper sheet has the protecting film layer as the outermost layer, and has the colored layer between the protecting film layer and the paper (the base material), it is possible to form the display on the protecting film layer by the UV coating material. As mentioned above, since the UV coating material can be hardened by the maxima laser (the wavelength between 248 and 351 nm), the display of the character and the like can be applied onto the protecting film layer by previously applying the UV coating material on the protecting film layer and employing the masking

method and the scanning method, that is, by the portion to which the laser beam is directly applied without being masked, or by scanning the laser beam. Further, it is possible to use the UV coating material for the pat printing or the screen printing on the protecting film layer, and it is possible to irradiate the ultraviolet ray and the maxima laser. The material mentioned above can be employed for the UV coating material, however, the acrylic type UV coating material having a high hardening speed is preferable, particularly, in the case of employing the masking method or the scanning method.

In this case, a process that the display of the character and the like is formed on the coating film of the UV coating material via the radical polymerization reaction by irradiating the ultraviolet ray or the maxima laser to the coating film of the UV coating material is as mentioned above.

The laser beam applied by the maxima laser apparatus has a short wavelength, and can not sufficiently heat and evaporate the resin, however, can harden the uncured UV coating material. Accordingly, the display of the character and the like can be applied by coating the uncured UV coating material on the protecting film layer, hardening the UV coating material in the portion of the uncured UV coating material to which the laser beam is

irradiated in accordance with the masking method or the scanning method, and thereafter wiping.

In accordance with the method, the display having an optional color can be applied without being affected by the base material.

Next, a description will be given of a preferable embodiment of a decoration body for a golf ball packaging case in accordance with the present invention with reference to the accompanying drawings.

Fig. 1 is a schematic view showing an embodiment of a decoration body for a golf ball packaging case in accordance with the present invention. The decoration body of the present embodiment is provided with a front cover 4 and a back cover 6 which are folded along a fold line 2, and a bar body 10 in which a base end portion is mounted to an inner surface of the back cover 6 and a golf ball shaped piece 8 is attached to a leading end portion. The front cover 4 and the back cover 6 are integrally formed by a paper. The golf ball shaped piece 8 is made of a paper on which a photograph of a golf ball is printed, and the bar body 10 is made of a transparent plastic. Further, although an illustration is omitted, a display of a UV coating material is formed on each of an inner surface of the front cover 4, an outer surface of the front cover 4 and an inner surface of the back

cover 6.

The decoration body in accordance with the present embodiment is structured such that the leading end portion of the bar body 10 ascends step by step in accordance with opening of the folded front cover 4. In other words, Fig. 1A shows a state in which the front cover is closed, Fig. 1B shows a state in which the front cover is opened at about 45 degree, and Fig. 1C shows a state in which the front cover is opened at about 90 degree. The decoration body in accordance with the present embodiment is structured such that when the front cover is opened as shown in Figs. 1B and 1C from the closed state shown in Fig. 1A, the leading end portion of the bar body 10 first ascends slightly as shown in Fig. 1B, and thereafter, the leading end portion of the bar body 10 further ascends as shown in Fig. 1C, whereby the golf ball shaped piece 8 attached to the leading end portion of the bar body 10 ascends like a hit golf ball.

In the present embodiment, a member shown in Fig. 2 is employed as a mechanism for performing a motion that the leading end portion of the bar body 10 ascends step by step in accordance with the opening of the folded front cover 4. The member 20 shown in Fig. 2 is integrally formed by the paper, and is provided with a first area 22 having an outer surface attached to the inner surface of the

front cover 4 and formed in an approximately trapezoidal shape, a second area 24 arranged in adjacent to the first area 22, having an outer surface attached to the inner surface of the back cover 6 and formed in an approximately trapezoidal shape, a third area 26 arranged in adjacent to the first area 22 and formed in a triangular shape, a fourth area 28 arranged in adjacent to the second area 24 and the third area 26 and formed in a triangular shape, and a fifth area 30 arranged in adjacent to the fourth area 28 and formed in an approximately trapezoidal shape. The base end portion of the bar body 10 is adhered to the fifth area 30.

An outer surface of the first area 22 is adhered to the inner surface of the front cover 4, and an outer surface of the second area 24 is adhered to the inner surface of the back cover 6 in a state in which a folded line 32 between the first area 22 and the second area 24 is aligned with the fold line 2 mentioned above between the front cover 4 and the back cover 6. Further, the fold line 32 between the first area 22 and the second area 24 is valley folded, a fold line 34 between the first area 22 and the third area 26 is valley folded, a fold line 36 between the second area 24 and the fourth area 28 is valley folded, a fold line 38 between the third area 26 and the fourth area 28 is mountain folded, and

a fold line 40 between the fourth area 28 and the fifth area 30 is valley folded.

Accordingly, in the state in which the front cover 4 is closed as shown in Fig. 1A, the member 20 is folded in a state in which the third area 26 and the fourth area 28 are held between the first area 22 and the second area 24, as shown in Fig. 3, and the bar body 10 is held between the front cover 4 and the back cover 6. Further, when the front cover 4 is opened as shown in Figs. 1B and 1C, an angle θ formed between the back cover 6 and the fifth area 30 is increased step by step as shown in Fig. 4, and the leading end portion of the bar body 10 ascends step by step in accordance with the increase of the angle.

The decoration body for the golf ball packaging case in accordance with the present embodiment can be used, for example, by firmly fixing the outer surface of the back cover 6 to a golf ball storage box, a rectangular frame member receiving the golf ball storage box and the like. However, the using method of the decoration body is not limited to them.

In this case, the mechanism for ascending the leading end portion of the bar body step by step in accordance with the opening of the front cover is not limited to the embodiment mentioned above, and the other mechanism may be employed. Further, in accordance with the present

embodiment, in addition to the bar body mentioned above, it is possible to arrange a paper decoration plate 50 having a front face on which a photograph of a fairway or the like is printed, and rising up vertically at a time of opening the front cover 4, as shown in Fig. 5. This decoration plate 50 is mounted to the front cover 4 and the back cover 6 via a paper frame body 52 which opens and closes in accordance with the opening and closing operation of the front cover 4 and is formed in a rectangular cross sectional shape. In this case, the decoration plate 50 and the frame body 52 are integrally formed, and an outer surface of the frame body 52 is adhered to each of the inner surface of the front cover 4, the inner surface of the back cover 6 and a back surface of the decoration plate 50. Further, the decoration body in accordance with the present invention may be structured such that the bar body and the golf ball shaped piece are integrally formed, or the back cover and the surface of the golf ball packaging case may be integrally formed.

As mentioned above, in accordance with the present invention, it is possible to efficiently and inexpensively form the display of the character and the like on the packaging case for packaging the article such as the golf ball, the golf glove and the like, by utilizing the laser beam.

Further, since the decoration body for the golf ball packaging case in accordance with the present invention is three-dimensional as mentioned above, and further performs the motion, the decoration body has a fun.